

Warm-up!

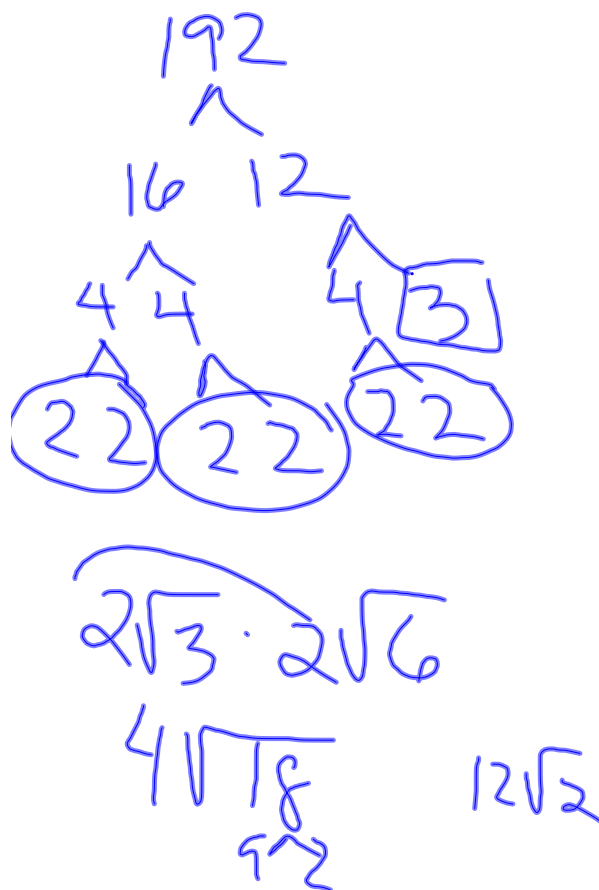
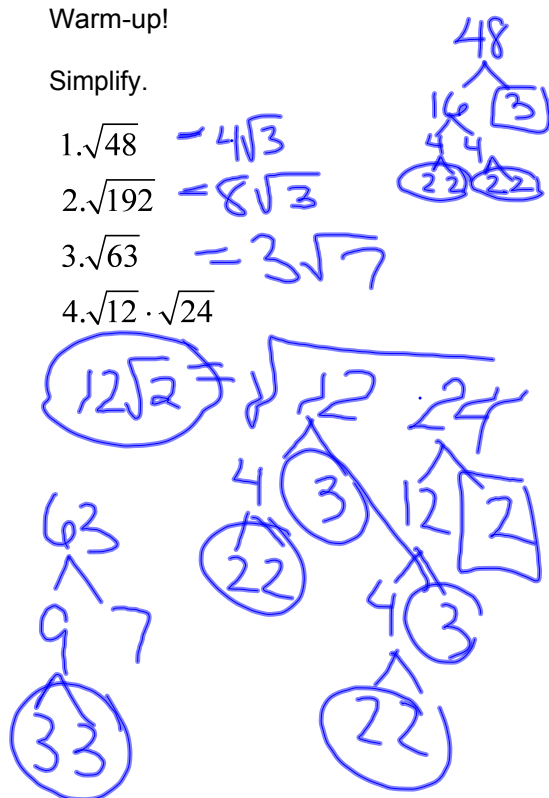
Simplify.

1.  $\sqrt{48} = 4\sqrt{3}$

2.  $\sqrt{192} = 8\sqrt{3}$

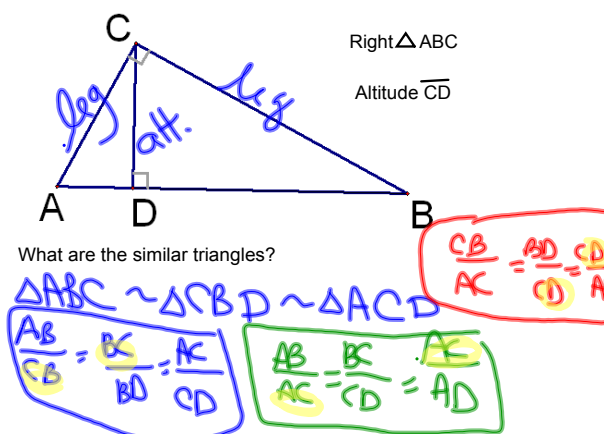
3.  $\sqrt{63} = 3\sqrt{7}$

4.  $\sqrt{12} \cdot \sqrt{24}$



## Chapter 7 Right Triangles and Trigonometry

## 7-1 Geometric Mean



Theorem 7-1--If the altitude is drawn to the hypotenuse of a right triangle, then the 2 triangles formed are similar to each other and the original triangle.

### Geometric Mean

$$\frac{r}{s} = \frac{s}{t} \quad s \text{ is the geometric mean}$$

Find the geometric mean between 3 and 8.

$$\frac{3}{m} = \frac{m}{8} \quad \sqrt{m^2} = \sqrt{24}$$

$$m = 2\sqrt{6}$$

Find the geometric mean between 9 and 14.

$$\frac{9}{m} = \frac{m}{14} \quad \sqrt{m^2} = \sqrt{9 \cdot 14}$$

$$m = 3\sqrt{14}$$

Do:

1. Find the geometric mean between 5 and 10.

$$5\sqrt{2}$$

2. Find the geometric mean between 12 and 8.

$$4\sqrt{6}$$

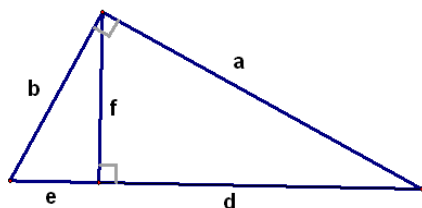
Theorem 7.2--....the altitude is the geometric mean b/w segments of hypotenuse

$$\frac{AD}{CD} = \frac{CD}{DB}$$

Ratios from the triangle.

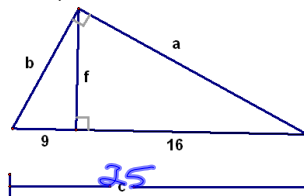
Theorem 7.3--....each leg is the geometric mean b/w the hypotenuse and the segment of the hypotenuse that is adjacent to the leg.

$$\frac{AB}{AC} = \frac{AC}{AD} \quad \frac{AB}{BC} = \frac{BC}{BD}$$



$$\frac{e}{f} = \frac{f}{d} \quad \frac{c}{a} = \frac{a}{d} \quad \frac{c}{b} = \frac{b}{e}$$

Example 1

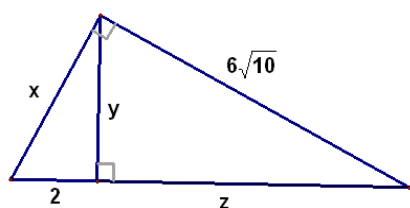


Find  
 $a = 20$   
 $b = 15$   
 $c = 25$   
 $f = 12$

$$\frac{9}{f} = \frac{f}{16} \quad \frac{25}{a} = \frac{a}{16} \quad \frac{25}{b} = \frac{b}{9}$$

$$f^2 = \sqrt{9 \cdot 16} \quad \sqrt{a^2} = \sqrt{16 \cdot 25} \quad \sqrt{b^2} = \sqrt{15 \cdot 25}$$

$$f = 12 \quad a = 20 \quad b = 15$$



$$\frac{2}{y} = \frac{y}{z} \quad \frac{2+z}{6\sqrt{10}} = \frac{6\sqrt{10}}{z} \quad \frac{2+z}{x} = \frac{x}{2}$$

HW

p346

20-23, 26, 28, 30

Keep answers in  
simplified radical form.